

REMARKS

By this amendment, Applicants have amended page 2, line 28 to correct a typographical error and have amended the claims to more clearly define their invention. In particular, Applicants have amended claim 2 to be in independent form by including therein all of the limitations previously recited in claim 1. In doing so, Applicants have corrected the expressions deemed indefinite by the Examiner in claim 1. These corrections are supported by, e.g., the paragraph bridging pages 2 and 3 and page 3, lines 12-19 of Applicants' specification. Claim 2 has also been amended to include therein the limitation previously recited in claim 3, with the phrase "the air" at the end of claim 3 being revised to read --low temperature air--. This revision is supported by, e.g., the description at page 19, lines 14-20 of Applicants' specification. Applicants have canceled claims 1 and 3 without prejudice or disclaimer, have canceled non-elected claims 17-25 without prejudice or disclaimer and have added new dependent claim 26 to further define the invention. Claim 26 uses the traditional Markush phrase "selected from the group consisting of" and recites that the "air" serving as the nitrogen oxide generation inhibiting gas has a temperature lower than the additional combustion air. See, e.g., page 19, lines 14-20 and page 24, lines 17-28 of Applicants' specification. The remaining dependent claims have been amended to ultimately depend from claim 26 and to provide proper antecedent basis for the terms therein. Claims 10 and 14 have been amended to eliminate the expressions therein deemed indefinite by the Examiner.

Claims 1-16 stand rejected under 35 U.S.C. 112, second paragraph. Applicants traverse this rejection and request reconsideration thereof.

The expressions deemed indefinite by the Examiner in claims 1, 10 and 14 have been amended by this amendment and the claims comply with the requirements of 35 U.S.C. 112, second paragraph.

With respect the phrase “placed along a width direction of said furnace” in claims 13 and 14, it is submitted this expression is correct, definite and supported by Applicants’ specification at, e.g., page 34, line 14 to page 36, line 5, as well as by Figures 17A, 17B and 18.

In view of the foregoing amendments and remarks, it is submitted all of the claims now in the application comply with the requirements of 35 U.S.C. 112, second paragraph. Therefore, reconsideration and withdrawal of the rejection of claims 1-16 under 35 U.S.C. 112, second paragraph, are requested.

In view of the cancellation of claims 1 and 3 and the change of dependency in claim 10, it submitted the rejection of claims 1, 3 and 10 in numbered section 2 of the Office Action is moot.

Claims 2, 4-9, 11 and 13-16 stand rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 4,545,307 to Morita et al. in view of U.S. Patent No. 5,727,480 to Garcia-Mallol. Applicants traverse this rejection and request reconsideration thereof.

The present invention relates to a combustion apparatus including a burner burning a fuel within a furnace in a theoretical air ratio or less, an air port arranged downstream of the burner and injecting additional combustion air into the furnace and an inhibiting gas supply means for supplying a nitrogen oxide generation inhibiting gas inhibiting a nitrogen oxide from being generated. The inhibiting gas supply means is provided in a mixing region formed by both a combustion gas generated by burning the fuel by means of the burner and a combustion air injected from the air port or near the

mixing region. The inner side of the air port is separated into a flow path injecting the combustion air and a flow path injecting the nitrogen oxide generation inhibiting gas. The nitrogen oxide generation inhibiting gas is constituted by at least one gas selected from a group comprising a combustion exhaust gas, a mixed gas of the combustion exhaust gas and air, and low-temperature air.

The Morita et al. patent discloses a coal combustion apparatus, which apparatus comprises a pulverized coal-feeding pipe inserted into a burner throat on the lateral wall of a combustion furnace and for feeding the coal and air into the furnace; a means for feeding the coal and air into the coal pipe; a secondary air passageway formed between the coal pipe and a secondary air-feeding pipe provided on the outer peripheral side of the coal pipe; a ternary air passageway formed on the outer peripheral side of the secondary air-feeding pipe; a means for feeding air or an oxygen-containing gas into the secondary air passageway and that into the ternary air passageway; and a bluff body having a cross-section of a L-letter form provided at the tip end of the coal pipe.

As admitted by the Examiner, the Morita et al. patent does not disclose the presently claimed invention, including “wherein an inner side of the air port is separated into a flow path injecting the combustion air, and a flow path injecting the nitrogen oxide generation inhibiting gas.”

In Garcia-Mallol, the secondary air flows out from the passages 28 and 30; however, air having the same composition and temperature flows out therefrom. Since the thermal NO_x is generated in the after air port of the two-stage combustion, the system of Garcia-Mallol can not inhibit NO_x. On the contrary, in the present invention, since the nitrogen oxide generation inhibiting gas is constituted by at least one gas selected from a group comprising a combustion exhaust gas, a mixed gas of the

combustion exhaust gas and the air, and low-temperature air, the operation of Garcia-Mallol is different from the present invention.

Accordingly, the Garcia-Mallol patent does not remedy any of the deficiencies of Morita et al. Therefore, the presently claimed invention is patentable over the proposed combination of Morita et al. and Garcia-Mallol.

Claim 12 stands rejected under 35 U.S.C. 103(a) as being unpatentable over Morita et al. in view of U.S. Patent No. 5,231,937 to Kobayashi et al. Applicants traverse this rejection and request reconsideration thereof.

The Kobayashi et al. patent has been cited by the Examiner as allegedly teaching that is known to lower the temperature of an exhaust gas by means of a heat exchanger. However, since claim 12 now ultimately depends from claim 2, it is submitted claim 12 is patentable at least for the reasons noted above with respect to claim 2.

Applicants note the Examiner has cited a number of documents as being pertinent to Applicants' disclosure. However, since none of these documents were not applied in rejecting the claims formerly in the application, further discussion of these documents is deemed unnecessary.

In view of the foregoing amendments and remarks, favorable reconsideration and allowance of all of the claims now in the application are requested.

Please charge any shortage in the fees due in connection with the filing of this paper, including excess claim fees, to Deposit Account No. 01-2135 (500.45104X00), and please credit any excess fees to such deposit account.

Respectfully submitted,
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